

What is claimed is:

1. A climbing device for attachment to a portion of a structure comprising:
a frame;
opposing jaws slideable relative to one another along the frame to engage a portion of the structure therebetween;
a footplate mounted to the frame and configured to support a load;
a handle mounted to the frame and coupled to the footplate, the footplate and the handle being displaceable relative to one another in response to an external force applied to the handle between a position, in which the climbing device is capable of sliding relative to the structure upon engagement the portion thereof by the jaws, and a position, in which the structure is locked between the jaws upon ceasing the external force; and
a locking mechanism located between the footplate and the handle and configured to prevent displacement thereof relative to one another upon ceasing the external force.
2. The climbing device of claim 1, wherein the locking mechanism includes a toothed rack and a pawl selectively meshing with teeth of the toothed rack upon removing the external force from the handle to ensure locking of the portion of the structure between the piston and one of the jaws.
3. The climbing device of claim 2, wherein the locking mechanism further includes a flexible arm pivotally coupled to the handle and operative to lift the pawl off the toothed rack to release the handle relative to the footplate in response to the external force applied to the handle.
4. The climbing device of claim 3, wherein the locking mechanism further includes a cam plate coupled to the pawl and to a trigger fixed to the flexible arm and displaceable therewith in response to the external force applied to the handle, the trigger being configured to move the cam plate so that the pawl disengages the toothed rack in response to applying the external force to the handle.

5. The climbing device of claim 4, wherein the pawl is mounted rotatably to the handle and configured to engage the cam plate mounted rotatably to the handle so that when the cam plate rotates in one direction upon ceasing the external force, the pawl rotates in a direction opposite to the one direction to mesh with the toothed rack and to lock the handle and the footplate relative to one another upon ceasing the external force.
6. The climbing device of claim 5, wherein one of the pawl and the cam plate is provided with a notch, while the other one has a lobe configured so that rotation of the cam plate in the one direction causes rotation of the pawl in the opposite direction.
7. The climbing device of claim 4, wherein the trigger is fixed to and configured to translate pivotal motion of the flexible arm upon applying the external force to the handle into rotational motion of the cam plate engaging the pawl so that the pawl rotates out of engagement with the toothed rack.
8. The climbing device of claim 4, wherein the flexible arm is spring to be biased so that when the external force is not applied to the handle, the pawl engages the toothed rack to lock the handle with respect to the footplate.
9. The climbing device of claim 1, further comprising a piston coupled to the footplate and to the handle and slidably mounted to the frame to move linearly from a release position, in which a space between the opposing jaws is cleared, and a locked position, in which the piston extends into the space between the opposing jaws.
10. The climbing device of claim 9, further comprising two spaced apart parallel shafts extending through respective channels formed in the piston and mounted to the handle and footplate, respectively to translate pivotal motion of the handle and footplate to linear motion of the piston.

11. The climbing device of claim 10, wherein each pair of the channels and the shafts forms a radial clearance therebetween to allow the handle and the footplate to pivot while the piston is linearly displaced.

12. The climbing device of claim 10, further comprising two spaced pins extending parallel to the shafts and spaced therefrom to extend through respective openings formed in the handle and the footplate and each having a respective diameter slightly larger than a diameter of the pins to allow the handle and footplate to pivot while the piston moves linearly.

13. A climbing device for attachment to a portion of a structure comprising:

opposing jaws slideable relative to one another;

a footplate mounted pivotally to one of the jaws and configured to support a load;

a handle mounted pivotally to the one jaw and coupled to the footplate; and

a reciprocating piston attached to the footplate and the handle and movable linearly in response to pivoting the handle and the footplate from a first position, in which a portion of the structure is placed between the opposing jaws, and a second position, in which the portion of the structure is secured between the other jaw and the reciprocating piston.

14. The climbing device of claim 13, further comprising two parallel and spaced-apart shafts traversing the reciprocating piston and terminating in the handle and footplate, respectively, to transmit pivotal motion of the footplate and the handle into linear motion of the piston towards the first position thereof in response to application of external force to the handle.

15. The climbing device of claim 13, further comprising a locking mechanism located between the footplate and the handle and configured to prevent displacement thereof relative to one another in the second position thereof, to which the piston moves upon ceasing the external force applied to the handle.

16. The climbing device of claim 15, wherein the locking mechanism includes a toothed rack and a pawl selectively meshing with teeth of the toothed rack in the second position, a flexible arm pivotally coupled to the handle and operative to lift the pawl off the toothed rack to release

the handle relative to the footplate when the piston is in the second position upon applying the external force applied to the handle.

17. The climbing device of claim 16, wherein the locking mechanism further includes a cam plate coupled to the pawl and to a trigger fixed to the flexible arm and displaceable therewith in response to the external force applied to the handle, the trigger being configured to move the cam plate so that the pawl disengages the toothed rack in the second position, the flexible arm being spring biased so that when the external force is not applied to the handle, the pawl engages the toothed rack to lock the handle with respect to the footplate.

18. The climbing device of claim 17, wherein the pawl is mounted rotatably to the handle and configured to engage the cam plate mounted rotatably to the handle so that when the cam plate rotates in one direction upon ceasing the external force, the pawl rotates in a direction opposite to the one direction to mesh with the toothed rack and to lock the handle and the footplate relative to one another in the second position thereof.

19. The climbing device of claim 18, wherein one of the pawl and the cam plate is provided with a notch, while the other one has a lobe configured so that rotation of the cam plate in the one direction causes rotation of the pawl in the opposite direction.

20. The climbing device of claim 15, further comprising a damping plunger provided with a plunger spring braced between the one jaw and the handle to bias the handle to the locked position upon ceasing the external force.